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REPORT CCG 71-57, NBS 2210471
NBS IR 75-648

ULTRASONIC INTERFEROMETER MANOMETER

Peter L. M. Heydemann
Pressure and Vacuum Section
Heat Division, NBS
Washington, D.C. 20234

January 1975

Quarterly report for period October 31, 1974-December 31, 1974

Prepared for CCG-Army/Navy

Abstract

A short description is given of the new, short column ultrasonic manometer now under construction.

INTRODUCTION

At the last CCG Meeting in August 1974 held at NBS Gaithersburg it was suggested to concentrate on the design and construction of a short column ultrasonic manometer for pressures up to about 100 mmHg. This manometer has been designed and is now under construction.

Short Description of Short Column Manometer

A detailed description of the new manometer will be deferred until the next report, when an assembly drawing will aid the explanation. The manometer, which has been fully designed and is now being manufactured, features three mercury columns contained in coated glass tubes of about 75 mm internal diameter. The columns are placed on a base plate. They are sealed with Teflon washers and clamped to the base plate with the help of four tie rods each and with individual top plates. A larger support plate carries the base plate and allows for horizontal adjustment with two degrees of freedom. The tubes are closed at the bottom with 6 mm thick titanium plates, which also carry the ceramic transducers.

All vacuum lines are 20 mm I.D. Sets of bellows are strategically placed in the lines to reduce the propagation of vibrations from the pumping system to the manometer. Additional inertial damping will be used to reduce the vibration levels.

Design and construction of the electronic system progresses well. Several changes have been made and a system has been designed that will allow all pertinent data to be read out into a digital recorder or teletype for processing. Alternatively a small digital processor could be connected to render the measured pressure in engineering units with a delay of only a few milliseconds.

We expect to have the instrument completed by the end of March.